AYK REGION
YUKON ESC. REPORT # 1

YUKON TERRITORY KING SALMON STUDIES

1970

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INTRODUCTION

In conjunction with the Canadian Department of Fisheries salmon counting program at the Whitehorse Dam fishway (in operation since 1959), the Alaska Department of Fish and Game began a special king salmon sampling project during 1970. A smaller than average 1970 Yukon River king run warranted collection of additional information. Preliminary catch data indicated a large percentage of small males comprising the run. In view of this, the Whitehorse station was used to make further studies of fish numbers and the percentage of females in the escapement. Aerial surveys were also conducted to assess king salmon escapement magnitudes in major spawning systems and to survey index streams (identified in 1968 (Figure 1).

METHODS AND MATERIALS

A fishery technician enumerated and sampled king salmon passing through the Whitehorse Dam fishway from July 26 to August 21. Daily records were kept of all kings utilizing the fishladder. Approximately 17 percent of the run was sampled for age, sex and size information and then released unharmed. Scale samples were removed from the area of the first or second scale row above the lateral line on a diagonal down from the insertion of the dorsal fin to the origin of the anal fin. All scales were interpreted for age and data tabulated.

For purposes of this report, a 4_2 salmon returning to spawn in 1970 would be the progeny of the 1966 run that migrated from fresh water to the ocean in the spring of 1968. A dip net was used to capture salmon out of the fishway. An aerial survey of the major king salmon spawning systems was conducted from a single engine aircraft in the Yukon Territory on August 20.

RESULTS AND DISCUSSION

At the Whitehorse Dam, a total of 625 king salmon was enumerated through the fishway from August 2 to 31 (Table 1). Of these, 104 were sampled for age, sex and size composition. Males were most abundant in all age groups with age 4_2 (30.8%) and 5_2 (45.2%) males dominating the sample. A 7:1 sex ratio in favor of males was noted. Data are presented in Tables 2 and 3. Fishway counts for the years 1959-1970 are summarized in Table 4.

A lack of the larger, older age kings in the sample indicates a possible over selection of these fish by the downriver commercial fishery which harvested the smallest catch since 1960. In addition, it is believed a preponderance of males exists naturally in the spawning run due to an earlier age of maturity attained by males. Sampling bias should also not be discounted since larger kings were more adept at avoiding a dip net and escaping the fishway trap than were the smaller king salmon.

Approximately eight hours were spent conducting aerial surveys of salmon spawning streams in the Yukon Territory. Selected streams of the Yukon and Teslin River systems were surveyed. Results are summarized in Table 5.

Table 1. Daily king salmon escapement counts, Whitehorse Dam fishway, Yukon River, 1970.

Date	Daily count	Cumulative total	
8/2	1	1	
3	3	4	
4	1	5	
5	1	6	
6	6	12	
7	6	18	
8	6	24	
9	23	47	
10	30	77	
11	31	108	
12	28	136	
13	66	202	
14	82	284	
15	29	313	
16	33	346	
17	69	415	
18	21	436	
19	75	511	
20	49	560	
21	16	576	
22	19	595	
23	15	610	
24	7	617	
25	5	622	
26	2	624	
27	1	625	
28	0	625	
29	0	625	
30	0	625	
31	Gate opened	625	Total

Table 2. Age, sex and size composition of king salmon sampled at Whitehorse dam fishway, Yukon River, 1970.

	Age Group				
	4_2	5_2	6_2	7_2	Total
Males					
Number	32	47	10	2	91
Percent	30.8	45.2	9.6	1.9	87.5
Mean length(cm)[1/]	56.8	69.8	84.8	92.8	67.4
Females					
Number	0	6	6	1	13
Percent	-	5.7	5.8	1.0	12.5
Mean length(cm)	-	73.8	88.1	90.0	81.6
Combined sexes					
Number	32	53	16	3	104
Percent	30.8	50.9	15.4	2.9	100.0
Mean length(cm)	56.8	70.2	86.0	91.8	69.2

1/ Mid-eye to fork of tail.

FIGURE 1. Upper Yukon River map.

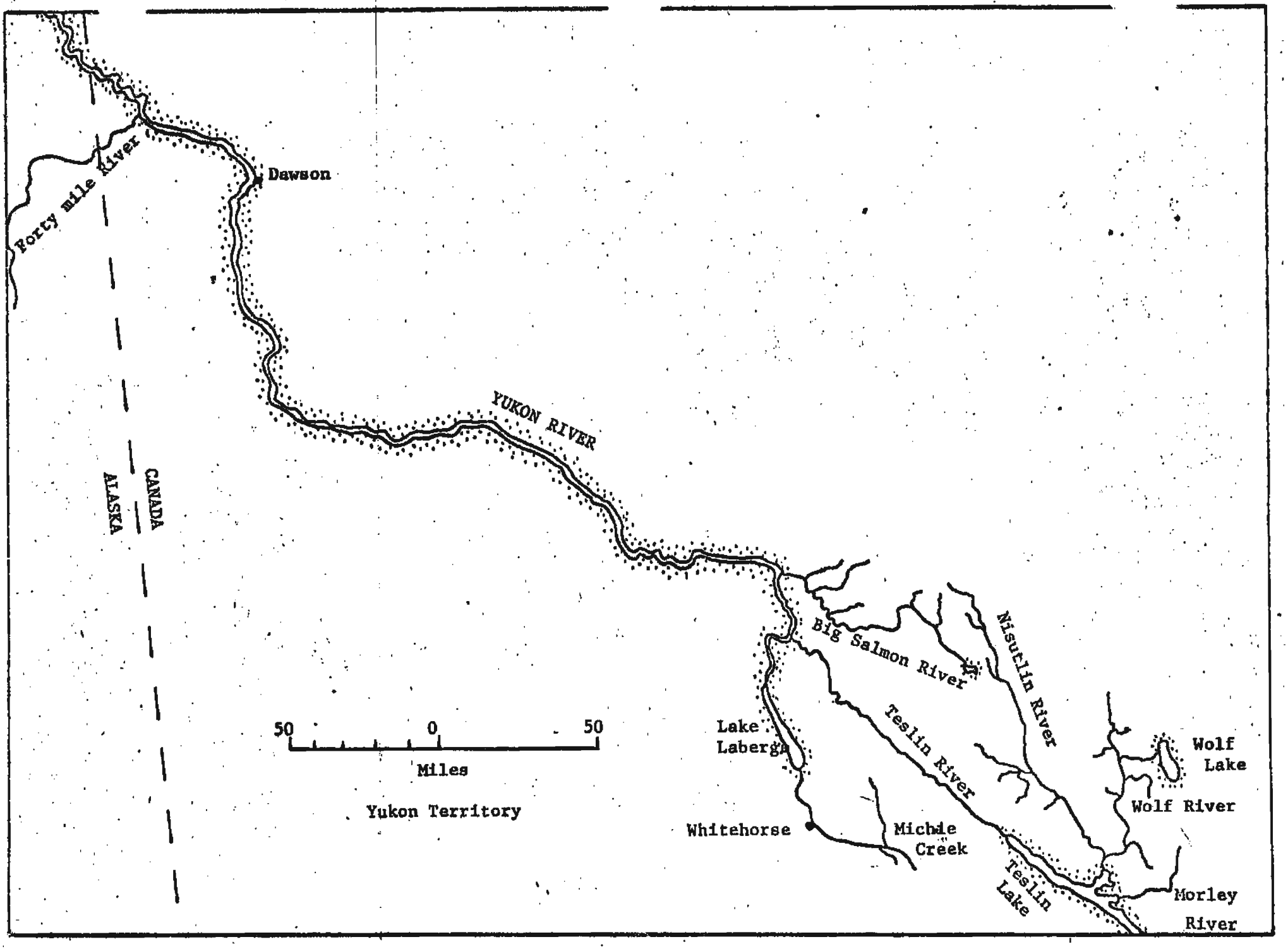

Table 3. Age composition of king salmon sampled by daily time period of migration, Whitehorse dam fishway, Yukon River, 1970.

Date	Age Group													
	Males					Females				Combined sexes				
	4_2	5_2	6_2	7_2	Total	5_2	6_2	7_2	Total	4_2	5_2	6_2	7_2	Total
8/ 6		2			2						2			2
7		2			2						2			2
8														
9		5			5						5			5
10		5			5						5			5
11		2	1		3						2	1		3
12		3			3	1	1		2		4	1		5
13	4	5	1		10	1			1	4	6	1		11
14	4	3	1	1	9					4	3	1	1	9
15	2	5	3		10					2	5	3		10
16	3	2			5	1			1	3	3			6
17	3	1	1		5		1		1	3	1	2		6
18	8	5	1	1	15	1	3	1	5	8	6	4	2	20
19	6	4			10	2	1		3	6	6	1		13
20	1	1	2		4					1	1	2		4
21	1	2	—	—	3	—	—	—	—	1	2	—	—	3
Total	32	47	10	2	91	6	6	1	13	32	53	16	3	104

Table 4. King salmon escapement counts at Whitehorse Dam fishway, 1959-1970.

Year	Count
1959	1,054
1960	660
1961	1,068
1962	1,500
1963	484
1964	587
1965	903
1966	563
1967	533
1968	407
1969	334
1970	625

Table 5. Aerial survey king salmon escapement counts, Yukon Territory August 20, 1970.

Stream (Location)	Survey rating	Count
Big Salmon River		
(Quiet Lake to Scurvy Creek)	Poor	362
(Scurvy Creek to South Fork)	Poor	308
Nisutlin River		
(Sidney Creek to Hundred Mile Creek)	Fair	615
(Lake outlet to McNeil River)	Fair	122
Michie Creek	Poor	20
Morley River	Poor	51
Wolf River	Poor	71
Teslin River[1/]	Fair	0
Tachun Creek[2/]		
(200 yard stretch above campground)	Fair	50

1/ Stream is too deep and turbid for counting in most places.
2/ Ground survey off highway.

All surveys were flown under overcast conditions meaning the counts would have been higher if clear skies had prevailed. Counts are actual and do not represent estimates of the total numbers of spawning fish present in each stream. Special experiments conducted by observers indicate that our aerial counts of king salmon probably do not exceed 50-60 percent of the total spawning population. The percentage counted for the Morley and Wolf Rivers were probably significantly lower than this.

The majority of observed king salmon were spawning and carcasses were rare. Although not possible to estimate from aerial surveys, there appeared to be a significant number of small king salmon present on the spawning grounds. A great range in fish sizes was noted.